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SUCH neuritic symptoms of pregnancy as pains in arms and legs, muscle weakness, and paresthesia of the extremities may result from a shortage of anti-neuritic vitamins; recent investigations appear to show. Strauss and McDonald report that polyneuritis of pregnancy is a dietary deficiency disorder similar to beriberi, responding to treatment with dried brewers' yeast, rich in vitamins B₁ and G. Wechsler, Hirst, Luskart, Gustafson, and other authorities observe that the avitaminosis is probably the result of hyperemesis gravidarum.

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RECENT ADVANCES IN THE SCIENCE OF NUTRITION

I. THE ROLE OF RIBOFLAVIN IN HUMAN NUTRITION

● In 1933, a series of articles on the vitamins was published, each article written by an authority in the field of nutrition. These papers served to summarize existing knowledge concerning these essential factors. During 1938 a similar series of articles has been issued. Comparison of related papers in these two series will indicate the most important advances in the science of nutrition which have been made in the course of the past five or six years.

In the first series of articles mentioned above, only two of the better known members of the old vitamin B complex received extended discussion (1). The more recent series, however, is characterized by the inclusion of a number of papers on riboflavin which, since 1932, has assumed a new significance in human nutrition (2). As compared with other factors with which it is often associated in nature, the rise of riboflavin to importance in human nutrition is somewhat anomalous.

For example, the effects upon humans of severe dietary deprivation of vitamin B₁ and the P-P factor are well known, in fact, such effects in themselves afford proof of the indispensable nature of these factors. While riboflavin is apparently concerned in cellular oxidation processes of mammals, the specific effect on humans of riboflavin deficiency is not known. Nevertheless, from the weight of evidence accumulated during the last five years, riboflavin is generally accepted as important in human nutrition. Authoritative opinion concerning riboflavin has been succinctly expressed as follows:

"The fact that we do not know any specific human disease due to shortage of riboflavin is entirely compatible with the view that this substance is important in human nutrition. A detailed discussion of reasons for believing that riboflavin plays a role in the life process of the human as

of other species would probably seem superfluous to a majority of readers at this date, and to a still larger majority in the future. Suffice it to point out that our species has evolved in the direction not of shortening the list of things it needs but of lengthening the list of things it can use to advantage." (2c)

Chemically, riboflavin is described as 6, 7 dimethyl-9 (d-l' ribityl) iso-alloxazine; a yellow-green, heat-stable pigment enjoying wide distribution in the plant and animal kingdoms. Many foods, therefore, of both plant and animal origin supply valuable amounts of this essential factor, specifically, fruits, vegetables, particularly the leafy pigmented types, and animal products such as milk and dairy products, meats, liver, and fish. It may, perhaps, be too early to estimate the daily human requirement for riboflavin. However, one rather liberal recommendation lists 600 units* as required daily by older children and adults; the estimated riboflavin requirement for younger children is somewhat less (2c).

In view of the above facts, attainment of an adequate intake of riboflavin would appear to be best insured by a varied dietary regime which includes the so-called "protective" foods. In the formulation of such diets, commercially canned foods may be particularly valuable. The older "vitamin C" assays—which are now known to measure principally the riboflavin contents of foods—indicate that modern canning procedures are without significant effect upon riboflavin. In addition, many foods valued for their contribution of this factor are canned commercially and hence are conveniently available at all seasons on practically every American market. Therefore commercially canned foods may be freely used in arranging such protective diets and they should materially assist in providing an adequate supply of this newly recognized dietary essential, riboflavin.

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1. 1932. J. Amer. Med. Assn. 98, 2201 and 2283
1932. Ibid. 99, 26 and 121.

2a. 1938. J. Amer. Med. Assn. 110, 1105.
b. 1938. Ibid. 110, 1188.
c. 1938. Ibid. 110, 1278.

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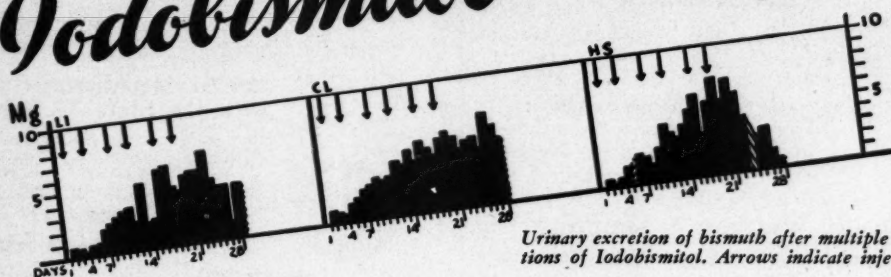
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¹ Sollmann, T., Cole, H. N., Henderson, K., et al.: *Amer. J. Syph., Gon. & Ven. Dis.* 21:480 (Sept.), 1937.

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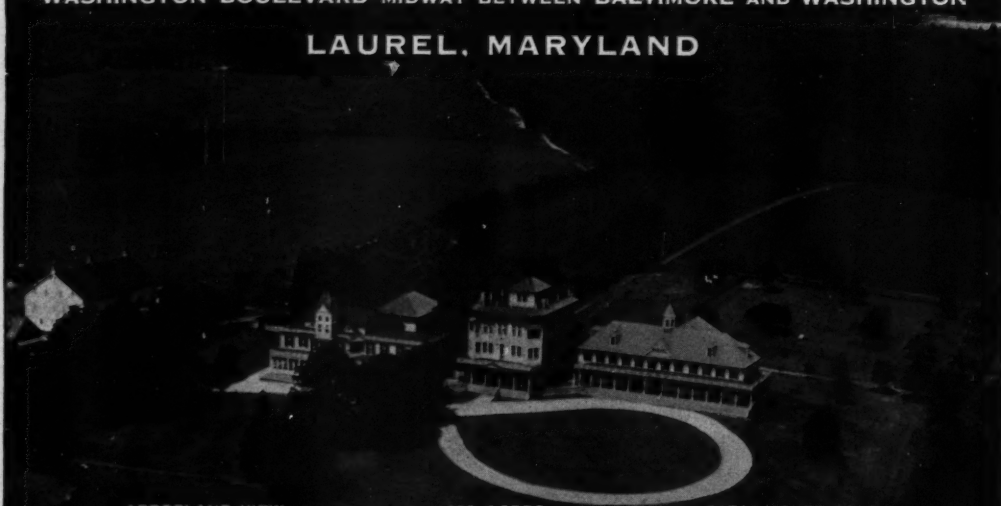
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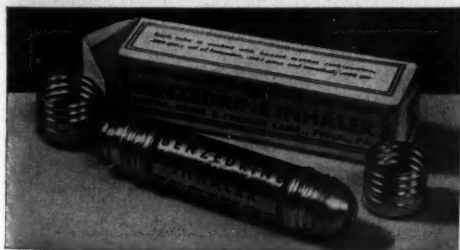
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THE CAUSES AND TREATMENT OF UTERINE BLEEDING*

BROOKE M. ANSPACH, M. D.**
Philadelphia, Pa.

In the normal woman bleeding from the uterus occurs at intervals. The physiologic phenomena of ovulation include the change in the structure of the endometrium which prepares it for the reception of the fertilized egg. The menstrual flow is a sign that conception has not occurred and that the endometrium, ready for nidation of the ovum, will be useless. The thickened mucosa now without a purpose disintegrates and is cast off, the bleeding ceases, the uterine cavity is cleared, the endometrium is restored to its resting stage and a new cycle begins.

Physiologists explain the building up (anabolic) process of the first stage better than the breaking down (catabolic) process of the second stage. Just what factors there are and how they act in the second stage of the cycle is a matter of conjecture.

The difficulty in understanding the normal uterine bleeding, menstruation, extends also to abnormal uterine bleeding. We may say in explanation of its production that either something goes wrong with the functional factors normally concerned or there arises some general disease or some local disorder that affects the genital parts.

Whether functional or general or local in origin, uterine bleeding may take one of two forms—menorrhagia or excessive menstruation and metrorrhagia or independent bleeding occurring at irregular intervals. Functional uterine bleeding may be primarily endocrine in origin or it may result secondarily from the toxic or noxious influences of gen-

eral disorders. The latter may be responsible for uterine bleeding also by reason of changes in the blood and in the capillaries. Local lesions of the genital canal from the vaginal introitus to the abdominal ostia of the tubes may be the cause.

Our interest centers in functional uterine bleeding since only in recent years have we found plausible explanations and some hope of mastering it. It is the source of great inconvenience and misery, being occasionally so persistent as to color unfavorably the entire existence of the individual from puberty to the menopause, promoting ill-health, blasting the hope of reproduction and being the source of much unhappiness. While functional disorders do not threaten the life of the individual, it is quite otherwise with general and local lesions and some of them, unless recognized and successfully treated, are bound to end in death. Since the symptoms from either of these sources, functional, general or local, are much the same, it is very important to distinguish between them. Only when no general or local disease can be found, even after the most thorough search, may uterine bleeding safely be regarded as functional.

The time limits of this paper will not permit us to discuss the general diseases that may be responsible. We refer especially to cardiovascular or hepatic disorders and the various forms of essential anemia or blood dyscrasias. When any of these are present they are often self-evident or picked up without delay in our first contact with the patient. Our remarks shall be limited therefore more or less to the bleeding that is purely functional, or purely organic in the sense of a local pelvic lesion.

Uterine bleeding presents itself in adolescence, during the reproductive period, at the close of menstrual life and later.

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BLEEDING AT PUBERTY AND DURING ADOLESCENCE

While the importance of looking for a local cause in any case is apparent, it does not apply as much to the young girl as to the mature and older woman. As the incidence of malignant or other organic causes between puberty and adult life is small we need not subject the adolescent girl to any but the simplest examination at the outset of our treatment. We should determine by bimanual palpation of the uterus and adnexa with the pelvic finger in the rectum that there is no gross enlargement of any of the pelvic organs and thus be at ease concerning uterine or adnexal tumors. It is often advisable, in addition, unless the result of treatment is prompt, to view the cervix through a small Kelly (cystoscopic) speculum with the patient in the knee-chest position. These things can be done in such a way that the sensibilities of the young woman are not offended.

When the symptoms appear to be functional after such an examination, treatment may be started upon that basis. The sex hormones now available and recommended for the control of functional uterine bleeding are in common use and the temptation to prescribe them seems to be nearly irresistible. Occasionally they appear to be effectual, although the discriminating observer may be in some doubt, since the establishment of the menstrual function in the young woman often requires a little time, and what appears to be the result of sex hormone treatment may be merely the natural course of events.

There is no question, however, of the importance of an appreciation of the general health of the young women and the adoption of those measures, medicinal and hygienic (*vide infra*) that may be needed. These come first and when they are adequately provided time alone, with better development and coordination of the endocrine functions, may work great changes. The periods may "settle down" and be no longer the source of inconvenience and worry.

So far as organo-therapy is concerned the thyroid is the most deserving of attention. Either too little or too much thyroid secretion may be the basis of bleeding. Even when the

B. M. R. is within normal limits the clinical features of the patient may be appraised and a careful trial made of thyroid substance or of iodine.

When it becomes quite evident that something more is needed then we may turn to the sex hormones. In choosing the one for trial we should remember that we do not need a hormone that builds up the endometrium; we need one that will bring about the premenstrual stage and favor normal menstruation. Since functional bleeding is so frequently associated with hyperestrinism and hyperplasia of the endometrium, the use of the estrogenic sex hormones, theelin, amniotin, can hardly be based on logical grounds. We may try with reason the anterior pituitary-like luteinizing hormones, follutein, antuitrin-S, or even better, progestin itself, prolution. While they are to be regarded as no more than substitutes, merely making up for a deficiency of the normal products, but not permanently stimulating the anterior pituitary or the ovary, they may tide the youthful patient over her period of adjustment.

Ocasasionally every measure fails and the blood loss becomes a positive menace. When operative aid is needed despite the patient's youth, it should be limited at the outset to curettage. Under general anesthesia this affords for the first time a completely satisfactory examination of the pelvic organs. An hitherto unsuspected organic lesion may be revealed and the histologic study of the endometrial scrapings will shed important information concerning pituitary and ovarian function. The very act of curettage by removing the bleeding mucosa may increase the tone of the uterine muscle and may stimulate the gonadotropic forces. While indiscriminate curettage is to be deplored, in such instances as these it serves an important and a useful purpose.

X-ray stimulation of the anterior pituitary is a questionable therapeutic procedure. Its apparent success is so occasional that not much reliance can be placed upon it.

As a last resort and only when for one reason or another the bleeding must be checked, intrauterine radiation may be employed. Used with discretion, it affords an excellent pros-

pect of relief and does no harm. We regard it as far preferable to x-ray treatment of the ovaries. There is much more risk of damage when radiation is applied to the ovaries than when it is applied to the inside of the uterus.

Curettage controls the bleeding sometimes only for awhile. When it recurs curettage without intrauterine radiation may again be tried. The second stimulation of the uterine muscle and the gonadotropic factors is sometimes greater than the first. One may always hope for the natural adjustment of function that takes place in the adolescent.

Sound judgment of when it becomes necessary to stop the bleeding with radiation depends upon all the circumstances of the case. Radiation should be limited to 150 mg. hours; it is better to repeat the dose than to give too much at first. While radiation in this degree may fail it does so less frequently than the other plans of treatment.

The subcutaneous administration of snake venom has been successfully used by Peck and Frank. It acts on either the blood clotting factors or the capillary wall. As its influence must be maintained very often by a repetition of the course of injections, we have regarded it with less favor than radiation.

BLEEDING DURING THE REPRODUCTIVE PERIOD

Bleeding in adult women is much more apt to be based upon organic disease and here there is no objection to an immediate and thorough examination and the prompt alleviation or correction of abnormalities by some plan of treatment, operative or otherwise.

We meet at this period in life the bleeding associated with abnormal pregnancies, uterine or tubal; polyps of the cervix or of the endometrium; myomata of the uterus and pelvic inflammatory diseases. Our object under such circumstances often must be to treat the disease more than the bleeding because indeed there are often associated symptoms that are even more deserving of attention.

When we employ major surgery solely for the cure of uterine bleeding we must be wary. The assumption on the part of the surgeon that certain pelvic conditions explain the bleeding is likely to lead him into error. For example, a displacement of the normal uterus is not often responsible for bleeding and a

slightly enlarged and cystic ovary may be nothing more than a sign of disturbed pituitary function.

The treatment of functional bleeding during the reproductive period is beset with the same difficulties found in adolescence. Nothing may be done to endanger the reproductive functions. Yet in the adult women the time has passed when a natural development and correlation of the endocrine forces may be as reasonably expected. There is evidently some deficiency that we must endeavor to supply.

Whether the anterior pituitary-like luteinizing hormones now available have the same effect in the human being as they have in experimental animals is a matter of speculation. The effect is sometimes so immediate that luteinization could scarcely have had time to occur, and the cessation of bleeding may have been a coincidence or it may have been brought about in some unknown way.

Progestin, the active principle of the corpus luteum, seems to offer greater possibilities in converting the intermenstrual into a premenstrual mucosa with normal menstruation as a sequence. Before the administration of progestin, curettage may serve a useful purpose. If the hyperplastic mucosa is removed the sex hormone may act more favorably upon the newly regenerated uterine mucosa. Curettage also gives the advantage of estimating the pituitary function as well as accurate diagnosis and the opportunity to remove simple intra-uterine lesions. The use of progestin, of course, is again merely substitution and may need to be repeated from time to time.

Much to be desired is a preparation of the anterior pituitary gland itself that contains its active gonadotropic principles; this would provide ideal stimulation of the ovary.

The administration of thyroid is diminished or of iodine in excessive activity of the thyroid gland may be quite effectual in the mature as well as in the youthful patient. When there are clinical symptoms suggestive of hypo- or hyper-thyroidism a careful trial of these remedies may be undertaken even though, as we have said, the B. M. R. is reported to be within normal limits. In the functional bleeding of mature years, as well as of adolescence, attention must be paid to this factor at the very

beginning when the state of the general health is being scrutinized. An estimate of the thyroid function and an attempt to place it upon a normal level should be one of the first considerations in every case.

It is an indubitable fact, however, that if we depend upon sex hormones or any form of organo-therapy alone we are not exhausting our therapeutic resources. We must raise the individual's well being to the highest point. The anterior pituitary gland not only governs the ovaries but also has a distinct influence on the thyroid, parathyroid, the adrenals, the pancreas and the vegetative nervous system. They are mutually interdependent for their complete normal activity. Our efforts to increase the general health of the individual almost certainly therefore will be reflected to the endocrine functions and the sex hormone of the laboratory will be augmented or replaced by an increase in the sex hormones of the individual.

To that end the physical condition of the patient should receive careful study and any deviations from the normal should be actively treated. This comprises the eradication of infectious foci, the treatment of hemic, cardiovascular, visceral, metabolic and allergic disorders. Attention should be given to the free elimination of waste products, muscular exercise, fresh air and sunlight. The underweight should receive a high caloric diet, rich in carbohydrate, fat and vitamins. In some cases insulin in small dose will increase the appetite and be of benefit.

The overweight should have a low caloric diet, restriction of fluids, increased elimination by laxatives, hot sweat baths and massage. While obesity is more frequently associated with amenorrhea than with uterine bleeding, it is often a sign of endocrine disturbance and as there seems to be a definite relationship between fat metabolism and gonadal function a reduction in weight should be attempted as it may go hand in hand with a renewal of the normal activity of the sexual functions.

In obstinate cases a second curettage may be performed, especially if the first one has been followed by the relief of symptoms for awhile. When the patient is married and desires children, pro-conception measures for

both husband and wife should be vigorously observed. Pregnancy may permanently cure the endocrine dysfunction.

When nothing seems to be of benefit, when the patient's symptoms are distressing and the ill health becomes a matter of concern, then intra-uterine radiation may be undertaken. The dose here should be a minimum one—200 to 300 milligram hours, too little rather than too much, the patient being warned that a repetition of the treatment may be necessary.

If childbearing is of no consequence to the patient, supravaginal amputation of the fundus with conservation of the adnexa is a certain final resource. A little of the endometrial cavity may be conserved with both adnexa so that menstruation continues in small degree and the ovarian functions are preserved.

BLEEDING AT THE MENOPAUSE AND LATER

As the end of the reproductive period is approached the incidence of malignant disease increases and at this time of life we have very little if any need of the various preparations that are advised so widely for functional bleeding. It might be said that they are a real menace, sedulously to be avoided. Our first concern must be the elimination of organic malignant disease of the uterus and one must not forget that cancer of the Fallopian tube and granulosa cell tumors of the ovary may explain bleeding at this period of life. If there is no evidence of malignancy anywhere in the pelvis then the intrauterine use of radium from 1200-1500 mg. hours is a certain and a harmless means of cure. When plunging the patient into an early or an artificial menopause is objectionable, a supravaginal hysterectomy with conservation of the adnexa is the procedure of choice.

Cancer of the uterus will require intra-uterine radiation alone, or as a preliminary to x-ray radiation or to hysterectomy.

If there is doubt from the gross appearance of the curettings, radium should be introduced at once and left in situ until, by a rapid preparation of histologic sections, the diagnosis is definitely made. When a benign lesion, hyperplasia, exists, 1200 to 1500 milligram hours is enough; when carcinoma is found the ra-

dium should be left in situ for at least 3600 milligram hours.

In women with postmenopausal bleeding, when the curettings grossly suggest hyperplasia and there is some ovarian enlargement, great care should be exercised to exclude granulosa cell tumors of the ovary. An excess of estrin in the urine is a valuable diagnostic point.

When there is a thin atrophic endometrium and virtually no curettings, careful examination of the adnexa is needed to exclude carcinoma of the Fallopian tube. If there is repeated chocolate or bloody discharge associated with the development of adnexal enlargement an exploratory incision may be indicated. When doubt exists as to whether either of these adnexal lesions exist, radiation should be postponed until the patient has been observed over a sufficient period.

Now, to recapitulate, the object of my paper is to bring to your attention the importance of distinguishing bleeding due to functional disturbance from bleeding due to local lesions; and, secondly, that in the young woman, before we start any treatment, a pelvic examination should be made through the rectum to be sure there is no growing lesion in the pelvis, and unless the treatment is promptly effective, look at her cervix—there may be a polyp there to explain the symptoms.

Then, in the young woman, we should not be too much in a hurry. I saw a young woman today in my office who is now ready to have her fourth child, who, for a couple of years after she started menstruation, had a lot of difficulty. In those days we had none of the hormones, and we used dessicated ovaries, which are now said to have no value whatever, and I suppose they do not. She gradually straightened out.

I do not want you to think for one minute that we use curettage indiscriminately. It is only as a last resort. It is always done very carefully, but sometimes, with anesthesia, gives the first opportunity to make a satisfactory examination.

Some of these young women really become in a very serious state. They lose so much blood that their hemoglobin gets low, and you

just have to stop the bleeding. You can stop it with radium, used in the way I have indicated.

Then, in the child-bearing woman, the same things apply more or less that we have already discussed, although there are more often organic causes, and no objection to making thorough examinations from the very beginning.

As we approach the climacteric stage our chief concern there must be to eliminate cancer, and there, I think, these sex hormones have no place whatever. Certainly, they ought not to be used ever without a preliminary curettage and a thorough examination. No time should be wasted even in trying them. Especially in the post climacteric. They should not be tried at all until we are sure there is nothing malignant. Even afterwards, if you want to get the patient well quickly, radium will be promptly and certainly effective.

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DISCUSSION

DR. S. W. RENNIE (Wilmington): I am sure we have all learned a great deal from this paper. There are a couple of questions I would like to ask Dr. Anspach; one, particularly, being to ask if he has had any results from the use of insulin, other than promoting an increase in appetite. From histological sections we find that the use of insulin does two or three things. Certain erosions of the cervix can be cured by it, and uterine musculature shows changes from the use of insulin. These very young cases of bleeding, rather than the type occurring at menopause, seem to have some results from the use of insulin.

Another question was as to the use of snake venom in cases not the young type, but the later cases, the ones occurring around the time of menopause in those patients who have had a curettage and have had the regular series of antuitrin-S injections, or other pituitary hormones from which they get no result. Does snake venom benefit these patients enough to use it?

I was reading recently of the use of dyes, particularly Congo Red. I have never had any experience with it. I have never heard of anyone using it, other than in the litera-

ture I have read. I would like to know if Dr. Anspach has employed this measure.

Recently, I have seen a few cases of bleeding. There was one little girl in whom bleeding has occurred for a number of years. One year ago she received antuitrin-S treatments, with very good results. A year later she began to have the same process all over again. She was confined to bed. She did not lose much weight. However, she became quite anemic. For her, instead of using anterior pituitary hormones, she was given x-ray therapy; that is, small doses—fifty hours for three doses, a total of one hundred fifty hours—and in this case her bleeding ceased.

We do find, however, cases of amenorrhea. We have had a number of those cases where they have received small doses of x-ray, and have had very good results.

In cases where we think there is migraine, that is, cases with severe headaches at the time of menstruation, they have also received small doses in the pituitary region, and they had very good results with reference to their headaches.

We do know that all these endocrines are hooked up in a continuous link, thyroid especially being the ones that have given the best results in a great number of cases.

I enjoyed the paper very much.

DR. ANSPACH: I was very interested in Dr. Rennie's remarks. We have used insulin only in association with the increase in well-being of the patient, the underweight patient.

I mentioned snake venom in my paper but I did not enlarge about it because I thought I might bore you too much. I think it sometimes appears to be successful. Dr. Peck and Dr. Frank of New York are especially enthusiastic about it.

Of course, these things, like all the substitution products, probably have to be repeated from time to time, but in the young woman that may be not objectionable. It tides her over her period of adjustment.

About Congo Red I know nothing.

About x-ray of the pituitary, I have no confidence in it, and we must remember that, after all, we do not know very much about it. X-ray men say that the x-ray does not stimulate; it always kills or depresses. That may

not be universally agreed upon at the present time, but when this subject first came up for discussion before the Obstetrical Society, Dr. Chamberlain was the President, and the apparent increase in activity of the pituitary following x-ray was supposed to be due to a relative increase in one of the other hormones.

The pituitary manufactures a great many hormones, and if you use x-ray to stimulate the pituitary hormones, as it affects the ovary, you do not know just what you are doing to the other hormones, so that we have thought it less useful than the use of radium.

No matter what you use or what plan you pursue you will have apparent success, and it is interesting always to pick up an old medical magazine and find out what was said fifteen or twenty years ago; and if you read magazines of fifteen or twenty years ago you will find articles in which the use of the dried ovary, or the corpus luteum, was highly recommended, and it proved successful in a majority of cases reported.

Probably the truth is that in the young woman we can try to avoid being radical in the hope that she may adjust herself. If you have to be radical, then radium in small doses certainly is a means of getting her well.

The same thing is true in the married woman, the reproductive woman, but a very important factor concerns the woman at the age of menopause. There these things should not be tried, because that is very dangerous.

CALCIUM THERAPY IN PUERPERAL INFECTIONS*

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In considering the role of calcium in the treatment of puerperal infections it should be borne in mind that in this type of infection we no longer look upon the inflammatory phenomena as a defensive or even a reparative process. On the contrary and to prevent further extension of the disease, therapy is directed toward localizing the pathologic condition as quickly as possible. Inflammation here, as elsewhere, is characterized by local swell-

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ing due to exudation, pain resulting from increased tissue tension combined with smooth muscle spasm, increase in local temperature as a result of congestion, and an elevation of general body temperature due to absorption of toxic substances of bacterial origin and from tissue injury.

In conjunction with the general treatment of puerperal infections the most satisfactory medicament is one that will not only relieve the subjective symptoms but which will also improve the resistance of the patient, neutralize toxic substances and hasten the return of the pathologic state to a normal condition. Calcium, because of certain well-known pharmacologic properties, is a logical adjuvant in the treatment of this as well as other inflammatory disorders.

Bayliss⁽¹⁾ showed many years ago that the calcium ion decreases cell permeability and thus tends to limit the exudation and transudation that accompany inflammation. According to Hamburger⁽²⁾ the ratio of calcium, sodium and potassium ions in a perfusing fluid is the determining factor in the formation of edema. The calcium ions tend to raise the resistance of the capillaries to permeation and at the same time act as a capillary stimulant, while the sodium and potassium ions on the other hand tend to increase the permeability of the capillary walls and favor exudation. Blum⁽³⁾ believes that the administration of calcium reduces the sodium content of the blood and prevents the migration of this ion into the tissues. Since water follows sodium, the accumulation of fluid which generally accompanies inflammation is therefore inhibited by calcium. Januschke⁽⁴⁾ first showed that typical inflammatory reactions produced by mustard oil can be prevented by the previous administration of adequate doses of calcium. Gold⁽⁵⁾ and Rothlin⁽⁶⁾ both found experimentally that pleural effusion produced by the intrapleural injection of copper sulphate is considerably reduced by calcium salts. Smejkal and Pisani⁽⁷⁾ concluded from their observations on the use of calcium gluconate in artificial pneumothorax that the calcium ion not only limits exudation and transudation but hastens the absorption of any exudate already present.

Clinically, Behan⁽⁸⁾ found that the pain

of cancer was entirely controlled or greatly modified by calcium injections, and Bauer, Salter and Aub⁽⁹⁾ secured dramatic relief from the abdominal distress of gallstone, renal and intestinal colic by the same method. Herrold,⁽¹⁰⁾ Ruper,⁽¹¹⁾ Cerf,⁽¹²⁾ and Leff and Spencer⁽¹³⁾ have reported that both pain and edema in gonorrheal epididymitis disappear rapidly following intravenous infusions of calcium. Zalewski,⁽¹⁴⁾ Pizzi,⁽¹⁵⁾ Diasio,⁽¹⁶⁾ Parvey⁽¹⁷⁾ and others have noted favorable results with calcium therapy in gonorrheal salpingitis, particularly in the acute forms, and Parvey also pointed out its value as a hemostatic in gynecologic conditions in which bleeding is a symptom.

Theobald⁽¹⁸⁾ reviewed the literature on the therapeutic use of calcium in eye conditions and has reported good results with it in her own practice in acute and chronic uveitis, herpes of the cornea and corneal ulcer. Still others including Nuhmann⁽¹⁹⁾ and Geiger⁽²⁰⁾ recommend the prophylactic use of calcium in operations on the nose and sinuses to reduce postoperative swelling and edema.

Tunnicliff⁽²¹⁾ and Hamburger and Hekema⁽²²⁾ have demonstrated experimentally on both man and animals that calcium increases phagocytosis by the leucocytes of the blood. Phagocytosis is, of course, one of the protective mechanisms of the body. Finally, Minot and Cutler⁽²³⁾ showed that calcium protects liver functions and is a physiologic antidote for toxic products generated from tissue injury occurring in the course of toxic states.

All of these properties of the calcium ion have a place in the treatment of puerperal infections. With calcium therapy the lower abdominal tenderness and pain are quickly relieved, the temperature rapidly returns to normal and further exudation is not only checked but the reabsorption of existing exudate is hastened.

Previous to the introduction of the gluconic acid compounds of calcium, the chloride and lactate were generally used. The irritating effects of both the chloride and lactate salts make these unsuitable for intramuscular injection since their irritant action may cause induration and even abscess formation. Cal-

cium chloride in particular is relatively quite toxic. The nausea and vomiting that sometimes follow its intravenous administration and the other symptoms of shock that may accompany its use unless it is given very slowly and with the greatest of care, limit its practical usefulness. Furthermore, both the chloride and the lactate are unpalatable and not suitable for prolonged oral use.

These objections have been overcome by the development of calcium gluconate (Calglucon) which is available in the form of tablets and granules for oral administration. Calcium gluconate contains 9.3% of calcium ion; the gluconic acid radical, an oxidation product of glucose, is completely burned in the body. For safe intravenous infusion and painless intragluteal injection the double salt of calcium gluconate and calcium galactogluconate is now being used and is available, under the trade name Neo-Calglucon, in stable ampule solutions equivalent in calcium ion content to 10 per cent and 20 per cent solutions of calcium gluconate.

The method of administering calcium employed in this study is a combination of that described by Zalewski, supplemented by oral administration. The contents of a ten cc. ampule of Neo-Calglucon were taken into a twenty cc. syringe, the needle was then inserted into a vein and ten cc. of blood withdrawn and permitted to mix with the calcium solution. One-half of this mixture was re-injected into the vein and the other half, after withdrawal of the needle, was injected deeply into the gluteal muscle. This method combines the rapid and intense effect of the intravenous injection with the slower but more sustained action of intramuscular absorption and in addition induces protective protein therapy action.

Daily injections were given in the majority of cases, but usually were not required beyond ten days. To intensify and prolong the effects established by the injection one heaping teaspoonful of calcium gluconate granules was given three times each day in milk or water. Oral dosage was continued even after the patient was discharged from the hospital to prevent any possible excitation of the infectious process.

In the obstetrical patient the violent peristaltic action of the tubes at the time of labor may result in the exacerbation of a latent infection. Parvey, for instance, reported the re-appearance of symptoms of tubal inflammation following abortion. Further a new infection may gain entrance to the uterus through the open blood or lymph sinuses.

This study is based on 26 puerperae in whom the temperature persisted above 101 F., for more than 48 hours without a demonstrable cause outside of the pelvis. The chief complaint was abdominal pain and tenderness, located in the lower portion of the abdomen. The pain was bilateral in 18 cases; unilateral in 8. Other complaints were frequency and urgency of urination. In 14 cases the vaginal discharge was putrid, and in the remaining 12 the discharge had decreased, though the constitutional symptoms were greater. Microscopic examination of the discharge from both cervix and urethra was positive for gonococci in 2 cases and negative in 24.

The treatment employed in this series of 26 cases was:

Rest in bed.

Ice bag to lower portion of the abdomen.

Elevation of head of bed.

Fluids in quantity.

Milk of magnesia when necessary.

No sedatives, douches or powerful cathartics permitted.

Neo-Calglucon, 1 ampule of 10 cc. of the 10 per cent product, was injected intragluteally and intravenously, as suggested, each day.

Calcium gluconate granules, one heaping teaspoonful three times daily before meals, in warm milk.

While injections were painless there was a generalized sense of warmth that lasted from two to three hours. The calcium given orally acted as a mild laxative, and as a rule no milk of magnesia was required.

With this treatment the average hospitalization period was 14 days, varying from a minimum of nine days to a maximum of 22 days. This disability time compared favorably with that in a similar group observed previously and to which the same treatment was given except for the omission of the calcium.

In those cases treated with calcium there was rapid alleviation of the pain, so that the patients were able to rest comfortably. In 19 cases the pain disappeared within 34 hours; in 4 cases in 48 hours and the rest within 72 hours. Rigidity of the abdomen was gone in 52 hours, and tenderness on pressure disappeared within 6 days. The temperature curve returned to normal within an average of 6 days. Calcium therapy relieved the pain so dramatically and so uniformly that if for no other reason calcium should be used in the treatment of puerperal infections.

At the time of dismissal all patients were given a pelvic examination. If there was any evidence of an inflammatory process, calcium was continued orally three times daily.

CONCLUSION

A series of 26 cases of puerperal infections was observed. In this series Neo-Calglucon was given intravenously and intramuscularly, supplemented with Calglucon by mouth in addition to the well-established routine treatment, and as a result:

The average period of hospitalization was 14 days, as compared to 21 days for a comparable group in which no calcium was given.

Relief from pain was impressive and occurred in most patients within 24 hours after beginning treatment. The patients became comfortable and were able to rest.

Rigidity of the lower abdominal and pelvic tissues disappeared in 52 hours. Tenderness and pressure over the lower abdomen was gone in from 4 to 6 days, and the temperature dropped to normal.

No untoward reactions were noted following the injection of calcium intramuscularly or intravenously.

Because of the constant diminution of hyperpyrexia, pain and disability, and the possibility of reducing the mortality, the deduction was made that calcium therapy is uniformly satisfactory, and can be used safely in the treatment of puerperal infections.

PUERPERAL INFECTIONS

Number of cases treated.....26			
Number of days of fever	Minimum 3 days	Maximum 8 days	Average 6 days
Duration of pain	24 hours	72 hours	44 hours
Duration of abdominal tenderness and rigidity	52 hours	7 days	6 days
Number of injections	9	24	10
Total number of days of disability	9 days	22 days	14 days

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THE COMBINED ORAL AND RECTAL ADMINISTRATION OF PARALDEHYDE DURING LABOR*

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In the search for methods by which to eliminate the pains of labor, the first consideration must be the safety of the agents employed; next in importance is their effectiveness; and finally, simplicity of administration. The procedure here to be described utilizes the drug commonly accepted as the least toxic agent by which unconsciousness can be obtained;⁽¹⁾ it provides complete absence of the memory of labor in 96% of cases, and the technic of administration is uncomplicated. Moreover, obnoxious side-actions, as excitement and local tissue damage, are not encountered when the patient is properly prepared and the details of the method are scrupulously carried out.

The use of paraldehyde in labor was first reported by Rosenfield and Davidoff⁽²⁾ in 1932. They gave it by rectum, with olive oil, as an adjuvant to pentobarbital. Observation of patients excited to the point of requiring restraint, and reluctance to recommend the relatively toxic barbiturates in the necessary dosage, led Kane and Roth⁽³⁾ to determine the efficacy of paraldehyde alone. Experiments upon animals showed that paraldehyde

*Read before the Delaware Academy of Medicine, Wilmington, March 7, 1938.

**From the Departments of Obstetrics and Gynecology and of Pharmacology and Therapeutics, George Washington University.

produced satisfactory analgesia without causing undue restlessness, when properly given. Later, when the drug was given to patients, it was found that both analgesia and amnesia were obtained.

While this work was in progress Colvin and Bartholomew (4) in 1934, reported success with a method similar to that of Rosenfield and Davidoff, in which sodium amytal was used instead of pentobarbital.

Believing that olive oil in the rectal injection delayed the absorption of paraldehyde and that the increased amount of fluid was retained less easily, Kane and Roth instilled the paraldehyde undiluted. It was found that the drug is somewhat irritating and that in many instances it was expelled. By adding the local anesthetic benzyl alcohol to the paraldehyde the rectal mucosa was sufficiently anesthetized to permit retention of the solution.

Experiments upon the intact and extirpated uteri of cats, rabbits and guinea pigs, and observation of patients in labor, by Roth and Kane (5) and the measurement of the force and frequency of uterine contractions by Moore and McCurdy (6), using the Dodek hysterograph, gave identical information; paraldehyde at first decreases the intensity and lessens the frequency of uterine contractions. After a few pains, however, this effect disappears and the uterus resumes its former power and rhythm. Benzyl alcohol, in the dosage recommended, apparently has little narcotizing action. The fact that in many cases, particularly in multiparae, dilatation of the cervix seems to be more rapid than is usual suggests that this benzyl compound relaxes the circular muscle of the cervix. A small series of animal experiments bears out this assumption. Examination of the rectal mucosa of animals showed that the solution is not sufficiently irritating to cause tissue damage, and clinically no case of proctitis has followed its use.

A detailed study by Kotz and Katzman (7) of 200 cases under paraldehyde-benzyl alcohol anesthesia furnished data which is in accord with the experience of others. These authors found: (1) conjunctival and corneal reflexes absent; (2) pupils contracted; (3) blood pressure lowered 10 to 30 mm. Hg.; (4) pulse rate increased 20 to 70 per minute—

the longer the patient was in labor the greater the increase of pulse rate, which varied from 90 to 140 per minute; (5) temperature elevated 1 to 4 degrees, varying with length of labor and amount of dehydration; (6) respirations increased 4 to 10 per minute, the amplitude being deep with the patient frequently snoring; (7) fetal heart rate increased 10 to 30 beats per minute; (8) total leucocyte count increased, varying between 12,000 and 33,000; (9) differential leucocyte count revealed segmented polymorphonuclears increased 75 to 89 per cent, band forms increased 1-3 per cent, lymphocytes decreased 10-23 per cent; (10) erythrocytes not changed; (11) hemoglobin not changed; (12) increased specific gravity of urine.

As possible contraindications to the use of paraldehyde, were considered diabetes and pathology of the liver, kidneys and the lungs.

Defandor (8) has shown that the drug produces a slight increase in blood sugar in dogs under anesthesia, but that the amount is insignificant, and there resulted no glycosuria. The CO₂ combining power in the blood may be lowered to a degree corresponding to that of a mild acidosis. Clinically, paraldehyde has been employed in several cases of diabetes with no untoward results. The tendency toward acidosis has been combatted successfully by the use of orange juice and dextrose as a routine part of the technique.

In the experience of the authors there has been no occasion to give paraldehyde to a patient with pneumonia, but they have used the drug in one case of acute pulmonary tuberculosis. In this connection, Dixon and Smart (9) state that paraldehyde is "one of the safest of the basal hypnotics for there is no respiratory depression." They advise doses of one dram hourly up to one ounce if necessary, in asthma and lobar pneumonia.

As one of the earliest suggestions for the use of paraldehyde in obstetrics was for controlling eclamptic convulsions, (10,11) it has been given to toxemic patients without fear of liver or kidney damage.

All observers agree that while the use of paraldehyde does not materially affect the length of labor, the average duration is somewhat shortened.

An objection frequently raised is that the unconscious patient is unable to "use her pains" during the second stage of labor. Observation of these cases has strengthened the belief that voluntary efforts do not aid in the expulsion of the fetus. Although these women are not allowed to "bear down" and pull on straps, the second stage progresses as rapidly as in cases in which the patients attempt to co-operate. This conservation of energy, combined with the 4 to 12 hours of sleep which usually follows delivery, undoubtedly is largely responsible for the freedom from exhaustion which is so noticeable.

In the 280 cases upon which this report is based, 212 were delivered from the wards of Gallinger Municipal Hospital under the direction of Mandy, and 68 were private patients. One hundred and fifty-nine of the hospital cases, a large percentage of whom were multiparae, were delivered spontaneously. The private patients were all delivered by outlet forceps when the head reached the perineum and by other procedures when necessary. When the presenting part begins to stretch the vulva the patient becomes so restless that aseptic technic is maintained with difficulty. It has been found that complete anesthesia and instrumental delivery provide a more satisfactory method of terminating labor.

Routine delivery by outlet forceps is being more and more widely practiced without regard to the type of anesthesia employed, and when properly performed it should be entirely harmless to the child. It has been found that the incidence of the much more dangerous mid forceps operation has been lessened by the fact that the patient is unconscious and therefore there is less temptation to interfere prematurely.

Ethylene has been used in all cases except when it has been impossible to secure the services of an expert anesthetist. When necessary, ether has been given, and it is in these cases that delayed respiration on the part of the baby has occasionally occurred.

Because, in many cases, hypnosis was not obtained until after a second rectal instillation had been given, morphine was frequently used one-half hour after the initial dose of paraldehyde-benzyl alcohol. In primiparous cases, with the prospects of long labor, no unfavor-

able action of morphine was feared. With multiparae, when labor is progressing rapidly from the start, the action of paraldehyde per rectum is too slow, and while the authors have never noted serious results following the use of morphine at any time during labor, in deference to consensus of opinion the administration of the drug has not been advocated in these cases. As a result, it was admitted that in multiparous labors of less than four hours duration the method was of little value.

When Douglas and Peyton⁽¹²⁾ published their results with the oral administration of paraldehyde and reported much more rapid action than was obtained when the drug was given per rectum, the authors adopted their method, with modifications, for the initial dose.

The technique now employed is as follows:

1. The patient is instructed to go to the hospital as soon as possible after the premonitory signs of labor appear. The object of the method is to relieve pain, and pain alone is the indication for beginning treatment, without regard for the condition of the cervix or the character of the contractions.

2. Soapsuds enemata are given until the return is absolutely clear. This is particularly important, as fecal matter in the rectum interferes with the absorption of the drugs, causes, in effect, inadequate dosage and results in restlessness on the part of the patient.

3. The oral dose of paraldehyde for patients weighing up to 170 pounds is 20 c. c. Above that, 1 c. c. is added for each 10 pounds of weight.

4. The paraldehyde is mixed with an equal amount of aromatic elixir and into the glass is put one-half teaspoonful of crushed ice.

5. The patient is given one teaspoonful of crushed ice which is held in the mouth until it is dissolved. This acts as a momentary local anesthetic.

6. While the ice in the patient's mouth is being dissolved, the paraldehyde-aromatic elixir mixture is vigorously stirred until the ice in the glass has melted.

7. While the effect of the ice in the mouth is still present, the patient as a rule experiences little difficulty in swallowing the ice-cold mixture of drugs. She is, however, allowed a few sips of ice water immediately

after taking the dose. Too much ice before and too much ice water after drinking the mixture, as well as orange juice and other taste-removers increase the tendency to vomiting. Plugging the nostrils with cotton was found to annoy the patients and has been dispensed with.

8. The average patient becomes definitely drowsy within 10 minutes, sleeps between contractions during the next 30 minutes, and thereafter is not aroused by the pains.

9. The effect of the initial dose usually lasts from two to four hours. When it is necessary to repeat the medication, the original method, paraldehyde-benzyl alcohol by rectum is adopted. In the occasional case in which the patient is still conscious one hour after oral administration, the rectal instillation is given at that time.

10. The rectum is irrigated with normal saline solution and the patient is placed upon her left side.

11. The minimum effective dose of paraldehyde, by rectum, is 1.2 c. c. for each 10 pounds of the weight of the patient at the beginning of labor.

12. The dose of benzyl-alcohol is always 1.5 c. c. As the action of this drug is largely that of a local anesthetic, the dose does not vary with the weight of the patient.

13. To the required amount of paraldehyde is added 1.5 c. c. of benzyl alcohol and the mixture is instilled into the rectum by gravity through a funnel and a large catheter which is inserted for a distance of 4 inches. As the solution disappears from the funnel it is followed by not more than 30 c. c. of normal saline solution which washes out the catheter and distributes the drugs. The bulk of the injection is so small that instillation can be accomplished between two contractions. While there is little tendency on the part of the patient to expel the solution, it is recommended that during at least 4 or 5 pains the buttocks be compressed.

14. The dose, and always the full dose, may be repeated if necessary, in one and one-half hours. As labor progresses it will be found that the effect of each successive injection is more lasting, the intervals between repetitions becoming 3, 4 or 5 hours.

15. When several doses of the mixture are given, the rectum should be irrigated with normal saline solution before each alternate instillation.

16. To minimize dehydration, a glass of orange juice or water should be given before each rectal injection. The patient is usually capable of cooperation to the extent of drinking; otherwise dextrose, intravenously, may be given.

17. Since the patient is not conscious of bladder distention, catheterization should be performed every eight hours.

18. Restlessness means that the rectum is not clean, the effect of the drug is wearing off, or that the presenting part is approaching the perineum. When it occurs during the first stage, the dose should be repeated at the first signs of awakening.

Twenty patients vomited almost immediately. In nearly every instance it was noted that the stomach contained food. Immediately after vomiting ceases the dose is repeated and the stomach, emptied by vomiting, practically always retains this second dose. In several instances vomiting has occurred twenty or thirty minutes after the paraldehyde mixture has been given. These patients have begun to be affected by the drug and oral administration is difficult. They, therefore, are given the paraldehyde-benzyl alcohol mixture by rectal instillation.

RESULTS

In estimating the value of this method in securing analgesia and amnesia the cases have been separated into five groups. Group A consists of those patients who have slept quietly from the time that the paraldehyde has taken effect. In group B are patients who have moved about, at times seemed to be completely rational and have complained of pain. As there is complete amnesia in these cases, the method is considered to have been successful. The patients who remember events but no pain constitute group C. Those who remember having had some pain but whose suffering was undoubtedly relieved are placed in group D. In group E are those who received no benefit.

(Concluded on page 204)

TUESDAY, OCTOBER 11, 1938**GENERAL SESSION****New State House**

10:30 A. M.—Invocation.

Rev. James W. Colona, Smyrna.

10:40 A. M.—Address of Welcome—

Mayor Wallace W. Woodford, Dover.11:00 A. M.—Surgery — Surgical Problems
of Hyperthyroidism—**I. S. Ravdin, M. D., Philadelphia.**

Discussors:

**W. Edwin Bird, M. D., Wilmington, and
H. V. P. Wilson, M. D., Dover.****LUNCHEON**

by the

KENT COUNTY MEDICAL SOCIETY**Hotel Richardson****12:15 P. M.****GENERAL SESSION****New State House**2:00 P. M.—Medicine—Arterial Hyperten-
sion—**Maurice C. Pincoffs, M. D., Baltimore.**

Discussors:

**Lewis B. Flinn, M. D., Wilmington, and
J. R. Elliott, M. D., Laurel.**2:40 P. M.—Obstetrics—The Classical Cae-
sarean Section; Its Advantages and Tech-
nique—Lantern Slides—**E. A. Schumann, M. D., Philadelphia.**

Discussors:

**Carl Henry Davis, M. D., Wilmington,
and W. T. Chipman, M. D., Harring-
ton.**3:20 P. M.—Pediatrics—Hypothyroidism in
Children—**Lawson Wilkins, M. D., Baltimore.**

Discussors:

**Charles E. Wagner, M. D., Wilmington,
and John Baker, M. D., Milford.**4:00 P. M.—Urology — Bloodstream Infec-
tions in Urological Cases—**Francis G. Harrison, M. D., Philadel-
phia.**

Discussors:

**Brice S. Vallett, M. D., Wilmington,
and N. R. Washburn, M. D., Milford.****TUESDAY, OCTOBER 11, 1938****MEETING OF THE HOUSE****OF DELEGATES****New State House****8:00 P. M.**

1. Call to order.
2. Roll Call.
3. Reading of Minutes of Last Session.
4. Appointment of Committee on Nomi-
nations.
5. Reports of Officers.
 - a. President.
 - b. Secretary.
 - c. Treasurer.
 - d. Councilors.
6. Reports of Standing Committees.
 - a. Scientific Work.
 - b. Public Policy and Legislation.
 - c. Publication.
 - d. Medical Education.
 - e. Hospitals.
 - f. Necrology.
7. Reports of Special Committees.
 - a. Woman's Auxiliary.
 - b. Cancer.
 - c. Syphilis.
 - d. Tuberculosis.
 - e. Medical Economics.
 - f. Criminologic Institutes.
 - g. Mental Health.
 - h. Maternal and Infant Mortality.
8. Report of Delegate to the American
Medical Association.
9. Report of Representative to the Dela-
ware Academy of Medicine.
10. Unfinished Business.
11. New Business.
 - a. Resolutions.
 - b. Communications.
 - c. Appropriations.
 - d. Approval of Scientific Program.
 - e. Selection of Meeting Place.
 - f. Miscellaneous.
12. Adjournment.

WEDNESDAY, OCTOBER 12, 1938**New State House**

9:30 A. M.—Report of House of Delegates.

10:00 A. M.—Presidential Address — The Medical Approach to Sex Instruction in the Schools of Delaware—

C. J. Prickett, M. D., Smyrna.

11:10 A. M.—Tuberculosis—The Indications for Surgery in the Treatment of Pulmonary Tuberculosis—

David A. Cooper, M. D., Philadelphia.

Discussors:

L. D. Phillips, M. D., Marshallton, and Stanley Worden, M. D., Dover.

10:30 A. M.—Allergy—Clinical Allergy—
Richard A. Kern, M. D., Philadelphia.

Discussors:

Joseph M. Barsky, M. D., Wilmington, and William Marshall, M.D., Milford.

11:50 A. M.—Election of the President for 1939.

2:00 P. M.—Cardiology—The Problem of Heart Disease as it Stands Today.

Thomas McMillan, M. D., Philadelphia.

Discussors:

Olin S. Allen, M. D., Wilmington, and Joseph B. Waples, M. D., Georgetown.

2:40 P. M.—Psychiatry—Modern Trends in Psychiatric Therapy—

Kenneth E. Appel, M. D., and James A. Flaherty, M. D., Philadelphia.

Discussors:

M. A. Tarumianz, M. D., Farnhurst, and Taleasin H. Davies, M. D., Wilmington.

3:20 P. M.—Syphilis—Present Day Control of Venereal Diseases from a State and National Viewpoint—

R. A. Vonderlehr, M. D., Washington, D. C.

Discussors:

I. L. Chipman, M. D., Wilmington, and J. R. Beck, M. D., Dover.

4:00 P. M.—X-Ray—The Status of X-Ray and Radium in Treatment of Cancer—

E. P. Widmann, M. D., Philadelphia.

Discussors:

George C. McElpatrick, M. D., Wilmington, Ira Burns, M. D., Wilmington.

DINNER

by the

STATE MEDICAL SOCIETY

Hotel Richardson

6:00 P. M.

8:00 P. M.—Public Address—The National Health Program and American Medicine—
Morris Fishbein, M. D.

Editor of the Journal of the American Medical Association, Chicago, Illinois.

Introduced by:

Harold L. Springer, M. D., Wilmington.

WOMEN'S AUXILIARY

to the

MEDICAL SOCIETY OF DELAWARE

WEDNESDAY, OCTOBER 12, 1938

New State House

2 P. M.

PRAYER

Greetings from the Advisory Committee,
Medical Society of Delaware

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UNFINISHED BUSINESS

NEW BUSINESS

DINNER

Hotel Richardson

6 P. M.

EDITORIAL

DELAWARE STATE MEDICAL JOURNAL

Owned and published by the Medical Society of Delaware. Issued about the twentieth of each month under the supervision of the Publication Committee.

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VOL. X SEPTEMBER, 1938 No. 9

MEDICAL BUREAUCRACY AND CRIPPLED CHILDREN

An illuminating example of what happens to medical service when bureaucracy enters between doctor and patient is being provided by the Washington state crippled childrens program. Here, in miniature, may be seen the workings of dictatorial governmental control of medicine and the threat of increasing cost coupled with deteriorating service to the patient. Here in actuality are the very things which the profession has predicted, if outside control enters the picture. Here is a real foretaste of state medicine.

The organization now in operation was stimulated by the federal social security legislation of 1935 which established certain requirements which were to be met by the state organization before federal funds would become available. As it is now financed, the fed-

eral government supplies approximately one-third of the funds for the plan. When possibilities of the proposed plan were first realized, a committee with members from Washington State Medical Association met with representatives of the State Department of Welfare.

Federal requirements were quickly met and the Washington state plans were submitted to the office in Washington, D. C., January, 1936. Expected approval did not materialize. Minor changes were made and every effort was put forth to get the plan into operation, only to be met with delay after delay on the part of the federal bureau in charge. Finally, in desperation, Governor Martin was approached for aid in getting state funds for the plan. Seeing benefits of the proposal, he appropriated \$50,000 of state funds so that the plan could be put into immediate operation. Federal funds were finally forthcoming, with temporary approval for five months.

After about six months operation, under a plan which referred these cases to orthopedists in private practice on a fee schedule basis with fees approximately half of the ordinary fees, the interference began. A representative of the federal bureau looked over the arrangements, decided that the state should have an orthopedic supervisor, and of course intended that the supervisor should come from Washington, D. C., with salary to be paid from the funds provided for care of crippled children of the state.

This move was strongly opposed on grounds that a local man would obtain far better co-operation, would know local situations far better and would be able to do the work for much smaller salary, thus conserving funds for actual care of children. The committee was finally permitted to name a Seattle orthopedist as supervisor.

After another period of relative tranquility the same representative of the federal bureau again looked over the situation in Washington state and criticised operation of the plan on basis of administrative costs. Criticism was aimed not at care being given the children, not at results being obtained, not at professional

service but at the fact that the administrative costs were too low! This federal agent stated that too small a portion of funds provided for care of crippled children was going to administration and office expense! This criticism was based on the fact that in other parts of the country statistical studies had shown administrative costs for similar plans to be higher than those in the state of Washington. The criticism was based purely on a study of statistics and not on a study of efficiency of operation or, what would really be significant, a study of actual benefits to crippled children. So far as can be determined, the latter study does not seem to interest those in Washington, D. C.

A few months ago word was received from the Washington, D. C., bureau that fees were too high and a cut was ordered. While most of the men working under the plan felt that they were already making considerable sacrifice in order to carry benefits of the plan to as many crippled children as possible, they did put through a cut of from ten to twenty per cent in fees in order to keep the plan in operation and avoid trouble with the federal bureau.

Most recent pronouncement from Washington, D. C., is to the effect that the fee schedule should be abolished anyway and certain doctors be put on salary to do the work. Eventually some members of Washington State Medical Association, who have seen what is happening in other states, feel that abolition of the fee schedule is desired in Washington, D. C., because other states have begun to ask for a fee schedule like that which has worked so well in Washington state. They feel that the federal bureau may not want to go to the trouble of setting up fee schedules for the other states.

In all discussions of operation of the Washington state plan there has not been one single criticism of the service being provided for crippled children of the state. There has not been the slightest suggestion that better care could be provided or that more children could be helped. The patient has been the last consideration. All suggestions and criticisms coming from the bureau in Washington, D. C., have had to do with administration and organization. There is growing in the state of

Washington a feeling that the federal bureau is slowly reaching and grasping for control which will spread to other phases of the practice of medicine and which may finally become absolute. There is growing also the feeling that crippled children of the state are actually being exploited for the benefit of bureaucracy in Washington, D. C.

Editorial, *Northwest Med.*,
Aug., 1938.

THE COMBINED ORAL AND RECTAL ADMINISTRATION OF PARALDEHYDE DURING LABOR

(Concluded from page 200)

TABLE I

RESULTS IN 280 CASES REPORTED

Group A Amnesia and Analgesia	Group B Amnesia and Analgesia	Group C Memory of Events No pain	Group D Memory of some pain	Group E Little or no relief
224	38	7	6	5
80%	14%	2.5%	2.1%	1.8%

In 1000 cases treated by rectal administration alone, 94% remembered no pain. In this smaller series, the combined oral and rectal method completely relieved the pain in 96.5% and produced absolute amnesia in 94%. The most noticeable improvement in the combined method over rectal administration alone, has been in the short, multiparous labors.

Thirty-one babies did not breathe promptly, but all responded readily to resuscitation by oxygen. The fact that the odor of paraldehyde is sometimes present in the babies' breath for one or two days after birth was somewhat disturbing at first. Careful observation, however, showed that these babies showed no drowsiness or other effects of the drug.

The average length of time between the first dose of paraldehyde and the appearance of the presenting part at the outlet has been, in primiparae, 17 hours and 26 minutes; in multiparae, 10 hours and 42 minutes. The duration of labor in primiparae ranged from one to 50 hours; in multiparae from one-half to 20 hours. The number of doses per case was from one to 10, the average being 4 in primiparae, and 2 in multiparae.

Two tragic mistakes have occurred which resulted in death to mothers. A patient of one of the authors (H. F. K.) was given three rectal instillations of formaldehyde. In the other case, a colleague ordered "benzyl alcohol 1.5

c. c." The order was read, "benzyl alcohol 115 c. c.," was so carried out and was so charted. Gross errors such as these are inexcusable and do not detract from the value of the method here described. They do, however, emphasize the need for meticulous attention to the proper administration of drugs in all instances and as DeLee has pointed out, that in deliberately inducing unconsciousness we must accept added responsibility.

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Galinger Municipal Hospital

INTERSEXUALITY

William H. Rubovits and William Saphir, Chicago (*Journal A. M. A.*, May 28, 1938), studied clinically, physiologically and psychologically a case of intersex, which, according to the older nomenclature, may be classified as pseudohermaphroditism masculinus. Although a laparotomy was not performed and thus the absence of ovaries was not definitely established, this diagnosis would hold true even if some rudimentary ovaries were present, for the presence of both ovaries and testicles in one individual cannot be called true hermaphroditism unless there is definite evidence of gonadal function, such as the presence of both ova and spermatozoa. Microscopic evidence of testicular tubular atrophy and absence of spermatogenesis was enough to rule out the diagnosis of true hermaphroditism and to confirm again the fact that true hermaphroditism never has been found in

man. The authors' case offers several facts of interest. Here is a patient with masculine intersex, brought up to be a woman, suffering from intense libido toward the male sex and masturbation. The question arises whether sexual desire is a manifestation rather of environmental influences than of gonadal function. The fact that sexual tension was relieved by orchidectomy could be evaluated in favor of the assumption that the gonads are responsible for sexual desire even if expressed toward the same sex. The common embryonic origin of ovaries and testes, the near chemical relationship of androgenic and estrogenic substances, which are found excreted by both males and females, and the favorable effects of castration in homosexuality are factors that would interpret libido as a specific manifestation of gonadal activity, no matter toward which sex they are expressed and no matter as to the environmental influences. The case, furthermore, offers interstitial testicular function apparently was not disturbed in the patient in spite of the marked tubular atrophy and absence of spermatogenesis. Interstitial hypertrophy was very marked, as evidenced histologically. No satisfactory explanation can be given at present for that phenomenon of mild heterosexual symptoms and varying degrees of features in women. Recently Koch and his associates found that women with hypertrichosis and virilism were excreting considerably more androgenic substance than normal women. It may well be conceivable that the presence of such aberrant or misplaced embryonic testicular tissue in women may give rise to a quantitative imbalance of gonadal hormone production and to the appearance of heterosexual symptoms. Titration for gonadal factors has not yet been adequately undertaken in such cases. It seems, however, more than a coincidence that manifestations of virilism always show involvement of either gonads or the adrenal cortex and always are characterized by marked heterosexual symptoms. It is to be hoped that further studies of this kind may throw some light on the etiology of heretofore unrecognized mild forms of intersexuality in women.



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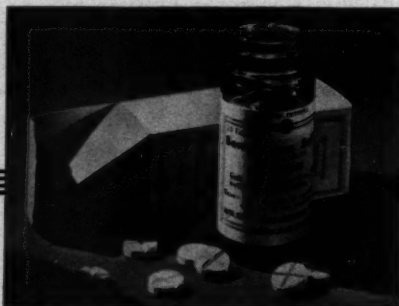
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in the July 2nd issue of the J. A. M. A.*



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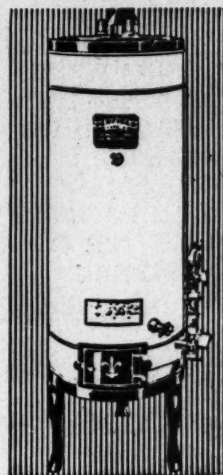
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